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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,514	03/01/2004	Henri V. Azibert	CTH-302	2753.
959 7590 08/31/2007 LAHIVE & COCKFIELD, LLP ONE POST OFFICE SQUARE BOSTON, MA 02109-2127			EXAMINER LEE, GILBERT Y	
			ART UNIT 3673	PAPER NUMBER
			MAIL DATE 08/31/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/791,514	Applicant(s) AZIBERT, HENRI V.	
	Examiner Gilbert Y. Lee	Art Unit 3673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6, 7 and 9-45 is/are pending in the application.
- 4a) Of the above claim(s) 3, 9-17, 25-28, 30, 31, 34, 36 and 43-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-7, 18-24, 29, 32, 33, 35 and 37-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed 6/19/07 has been entered.

Claim Objections

2. Claim 1 is objected to because of the following informalities: lines 12 and 13 should read "positioned to be contacting a non-seal face of the seal ring when disposed in the second position when subjected to a second pressure condition different from said first pressure".

Appropriate correction is required.

3. Claim 32 is objected to because of the following informalities: lines 14-16 should read "positioned to be contacting a non-seal face of the seal ring when disposed in the second position when subjected to a second pressure condition different from said first pressure condition." Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Note for reference characters C and D refer to the Examiner's Attachment C in PaperNo. 20061211.

4. Claims 1, 2, 4, 6, 7, 18-20, 23, 29, 32, 33, 35, and 37-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Clark et al. (US Patent No. 5,913,520).

Regarding claim 1, the Clark et al. reference discloses a mechanical seal (Fig. 9) for mounting to a housing (e.g. 14) containing a rotating shaft (e.g. 12), said mechanical seal comprising:

- a gland (41);

- at least one pair of seal members (e.g. 25 and 33) disposed at least partially within the gland, said seal members including a rotary seal ring (25) having a rotary seal face (Fig. 2) and a stationary seal ring (33) having a stationary seal face engaging the rotary seal face (Fig. 2); and

- a shuttle member (e.g. including 280, 202A, and 202B) positioned relative to one of the rotary seal ring and the stationary seal ring (Fig. 9) and axially movable between a first position (e.g. Fig. 8A) and a second position (e.g. Fig. 8B) in response to changing pressure conditions within the mechanical seal (Col. 11 Line 45-Col. 12 Line 15), wherein the shuttle member is axially separated from the non-seal face of the seal ring when disposed in the first position (e.g. Fig. 8A) when subjected to a first pressure condition (e.g. Fig. 8A), and is positioned to be contacting a non-seal face of the seal ring when disposed in the second position when subjected to a second pressure condition different from said first pressure condition (e.g. Fig. 8B), the shuttle member comprising a carrier element (e.g. 280) having a first end portion (e.g. lower portion of

280) adapted to be disposed proximate to the non-seal face of the rotary and stationary seal rings (Fig. 9), and a second end portion (e.g. upper portion of 280) which extends beyond the rotary and stationary seal rings (Fig. 9). Note that the carrier element extends upwardly beyond the rings.

Regarding claim 2, the Clark et al. reference does not specifically disclose that the shuttle member (e.g. including 280, 202A, and 202B) generates a biasing force, however, it is inherent that the shuttle member will generate a biasing force because the shuttle member will move between positions and abut other elements causing a biasing force.

Regarding claim 4, the Clark et al. reference discloses the shuttle member (280) disposed adjacent the stationary seal ring (e.g. Fig. 2).

Regarding claim 6, the Clark et al. reference discloses the carrier element further comprising a groove (e.g. groove which element 202A or 202B is inserted) for seating a sealing element (e.g. 202A or 202B).

Regarding claim 7, the Clark et al. reference discloses the sealing element being an O-ring (Col. 12, Lines 41-49).

Regarding claim 18, the Clark et al. reference discloses a first piston area (C) defined by an outer edge of the radially extending seal face of one of the seal rings and an axially extending, inner surface of the shuttle member (Fig. 9), and

a second piston area (D) defined by an inner edge of the radially extending seal face of one of the seal rings and an axially extending, inner surface of the shuttle member (Fig. 9).

Regarding claim 19, the Clark et al. reference discloses the first piston area and the second piston area being about equal in size (See Examiner's Attachment C).

Regarding claim 20, the Clark et al. reference discloses the first piston area and the second piston area being smaller than a contact area of the rotary seal face and the stationary seal face (See Examiner's Attachments C).

Regarding claim 23, the Clark et al. reference discloses the gland comprising means for introducing a barrier fluid to the seal (Col. 11, Lines 10-27).

Regarding claim 29, the Clark et al. reference discloses the shuttle member abutting a shuttle stop (192) during the first pressure condition when the pressure of a process fluid in the seal is greater than the pressure of a barrier fluid in the seal to define a first piston area on the non-seal-face of the rotary seal ring (Col. 11 Line 45-Col. 12 Line 15).

Regarding claim 32, the Clark et al. reference discloses a mechanical seal (e.g. Fig. 2) for mounting to a housing (14) containing a rotating shaft (12), the mechanical seal including a gland (41); at least one pair of seal members (e.g. 25 and 33) disposed at least partially within the gland, said seal members including a rotary seal ring (25) having a rotary seal face (Fig. 2) and a stationary seal ring (33) having a stationary seal face engaging the rotary seal face (Fig. 2); and a shuttle member (e.g. including 280, 202A, and 202B) positioned relative to one of the rotary seal ring and the stationary seal ring (Fig. 9), wherein the shuttle member comprises a carrier element (280) having a first end portion (e.g. lower portion of 280) adapted to be disposed proximate to the non-seal face of the rotary and stationary seal rings (Fig. 9), and a second end portion (e.g.

upper portion of 280) opposite the first end portion which extends beyond the rotary and stationary seal rings (Fig. 9, note that the carrier element extends upwardly beyond the rings), a method comprising:

axially moving the shuttle member between a first position (e.g. Fig. 8A) and a second position (e.g. Fig. 8B) in response to changing pressure conditions within the mechanical seal (Col. 11 Line 45-Col. 12 Line 15), wherein the shuttle member is axially separated from the non-seal face of the seal ring when disposed in the first position when subjected to a first pressure condition (e.g. Fig. 8A), and is positioned to be contacting a non-seal face of the seal ring when disposed in the second position when subjected to a second pressure condition different from said first pressure condition (e.g. Fig. 8B).

Regarding claim 33, the Clark et al. reference does not specifically disclose that the shuttle member (280) generates a biasing force, however, it is inherent that the shuttle member will generate a biasing force because the shuttle member will move between positions and abut other elements causing a biasing force.

Regarding claim 35, the Clark et al. reference discloses disposing the shuttle member adjacent the stationary seal ring (Fig. 9).

Regarding claim 37, the Clark et al. reference discloses defining a first radially extending piston area (C) on the rotary seal ring for biasing the rotary seal ring against the stationary seal ring under the first pressure condition (Fig. 9), and

defining a second piston area (D) on the rotary seal ring for biasing the rotary seal ring against the stationary seal ring under the second pressure (Fig. 9).

Regarding claim 38, the Clark et al. reference discloses defining a first piston area (C) defined by an outer edge of the radially extending seal face of one of the seal rings and an axially extending, inner surface of the shuttle member (Fig. 9), and defining a second piston area (D) defined by an inner edge of the radially extending seal face of one of the seal rings and an axially extending, inner surface of the shuttle member (Fig. 9).

Regarding claim 39, the Clark et al. reference discloses sizing the first piston area and the second piston area to be about equal in size (See Examiner's Attachment C).

Regarding claim 40, the Clark et al. reference discloses sizing the first piston area and the second piston area to be smaller than a contact area of the rotary seal face and the stationary seal face (See Examiner's Attachments C).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 21, 22, 41, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. in view of Azibert et al. (US Patent No. 5,213,340).

Regarding claims 21, 22, 41, and 42, the Clark et al. reference discloses the invention substantially as claimed in claims 18 and 38.

However, the Clark et al. reference fails to explicitly disclose the percentage of the area of the first and second piston areas compared to a contact area of the rotary seal face and the stationary seal face.

The Azibert et al. '340 reference, a balanced mechanical seal, discloses making the piston area to be less than 100% and preferably about 70% of the contact area of the seal faces (Col. 1, Lines 22-26).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a piston area of about 70% of the contact area of the seal faces in view of the teachings of the Azibert et al. '340 reference in order to minimize heat generation from the frictional contact of the seal faces while maintaining a closing force on the seal faces sufficiently high to assure proper sealing (Azibert et al. '340, Col. 1, Lines 26-29).

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. in view of Azibert et al. (US Patent No. 5,333,882).

Regarding claim 24, the Clark et al. reference discloses the invention substantially as claimed in claim 1.

However, the Clark et al. reference fails to explicitly disclose a second pair of seal members.

The Azibert et al. '882 reference, a balanced mechanical seal assembly, discloses the use of a primary and secondary seal members (Col. 2, Lines 43-52).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide an identical secondary seal member axially spaced from the primary seal member of the Clark et al. reference in view of the Azibert et al. '882 reference in order to form inboard and outboard seals with a sealed barrier fluid chamber thereinbetween (Azibert et al. '882, Col. 2, Lines 53-57).

Response to Arguments

7. Applicant's arguments filed 6/19/07 have been fully considered but they are not persuasive.

With regards to the applicant's argument of claims 1 and 32, the argument is not persuasive because the claims only require the carrier element to be extending beyond the seal rings. The claims do not definitely claim in which direction the carrier element is extending beyond the rings; therefore, the Clark et al. reference discloses the invention substantially as claimed in claims 1 and 32.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gilbert Y. Lee whose telephone number is 571-272-5894. The examiner can normally be reached on 8:00 - 4:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patricia L. Engle can be reached on (571)272-6660. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GL
August 24, 2007

A handwritten signature in black ink, appearing to read "Patricia Engle", with a large, stylized loop at the end.

Patricia Engle
Supervisory Examiner
Tech. Center 3600